

In her rebuttal to the Response to Arguments filed on February 15, 2002, the Examiner states that Shieh is being relied upon [in this 103 rejection] for the teachings that lysing reagents, generally, may be dried upon a solid support and allow lysis. The Examiner also goes on to state that the ordinary artisan would have been motivated to have prepared the pre-treated lysing membrane of Shieh, for use in the method of Boom, and that the skilled artisan would have had a reasonable expectation of success for analyzing DNA from a solid support that was pretreated with a lysing reagent since Boom teaches a method in which all three components, a lysing reagent, solid support and nucleic acid sample, were contacted with successful results.

It is respectfully pointed out to the Examiner according to the method disclosed in Boom "it is essential to use a chaotropic substance" such as guanidinium (iso)thiocyanate and guanidinium hydrochloride, and urea. See Boom, Col. 3, lines 56-67. Also, see Boom, Claim 3. Thus, the process according to Boom requires the use of highly toxic chaotropic substances such as the aforementioned chaotropes. Sufficiently large amounts of chaotropes are mixed with the biological material (for example in a chaotrope:biological material ratio of 1:18). Thus, although Boom teaches the combination of a lysing reagent (chaotrope), solid support (beads) and nucleic acid sample, Boom specifically teaches the combination of an excess of chaotropic lysing reagent to enable complete lysis of the biological sample.

Shieh on the other hand teaches conditions in which the lysis of red blood cells will occur. Shieh teaches that a membrane may be treated with any agent used in the art to cause lysis of red blood cells (See Shieh, Col 10, line 67 to Col 11, line 1). Thus, Shieh teaches that the membrane was dipped in a solution of a surfactant such as 2% Mega-8 and dried to achieve

the purpose of lysing red blood cells. The cell lysing component of Shieh is defined to be one that causes disruption of the cellular structure such that a determination of total glycoprotein can be made (See Shieh, Col. 14, lines 21-22). The conditions described in Example 3. B that the Examiner relies upon to assert that Shieh teaches lysis of whole blood are identical to those in which Shieh teaches the lysis of red blood cells. Taking the aforementioned teachings of Shieh into account as a whole, one skilled in the art would believe that when Shieh states that the "lysis of whole blood" occurs, Shieh is specifically referring to the cellular lysis of red blood cells in which the cellular membrane is disrupted to release glycosylated proteins and hemoglobin. Nowhere in the entire specification or claims does Shieh mention nucleic acids. The conditions that Shieh teaches are wholly related to the preferential rupture of red blood cells. Nowhere does Shieh teach or suggest that the conditions in which a "lysing reagent" as defined by Shieh would result in cell lysis of the sort contemplated by either the instant invention or Boom.

When an obviousness determination relies on the combination of two or more references, there must be some suggestion or motivation to combine the references. The Examiner is assuming that one skilled in the art could apply the same conditions used in Boom in which a strongly chaotropic lysing reagent is used in excess to cause lysis to that taught in Shieh in which a surfactant is provided at conditions to cause the disruption of red blood cells. The fact that Boom requires a chaotrope in excess to cause lysis teaches away from applying a very small fractional amount of that lysing reagent to a membrane to cause lysis. The Examiner's assertion that Shieh is being relied upon to promote the idea that lysing reagents in general can

be applied to membranes to cause lysis of cells such as to release DNA is an over-reaching assumption because Shieh does not provide such a teaching. Furthermore, the teachings of Boom in which an excess of chaotrope is mandated to cause lysis teach away from the Examiner's assertion.

Item 5. The Examiner states that "[c]laims 1-20, 24-33, 37-41, 44-49, 54-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000)."

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.

Item 6. The Examiner states that "[c]laims 38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5,234,809) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-3, 5-6, 11-21, 23-30, 32-33, 37, 39, 41, 45-51, 53-56, 58, 60-62 above, and further in view of in view of Deggerdal (WO 96/18731)."

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.

Item 7. The Examiner states that "[c]laims 23 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-20, 24-33, 37-41, 44-49, 54-62 above and further in view of Boom (5,234,809)."

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.

Item 8. The Examiner states that “[c]laims 7, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5,234,809) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-3, 5-6, 11-21, 23-30, 32-33, 37, 39, 41, 45-51, 53-56, 58, 60-62 above and further in view of Su (5,804,684).”

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.

Item 9. The Examiner states that “[c]laims 42-43 are rejected under 35 U.S.C. 104(a) as being unpatentable over Boom (5,804,684) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-3, 5-6, 11-21, 23-30, 32-33, 37, 39, 41, 45-51, 53-56, 58, 60-62 above or Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-20, 24-33, 37-41, 44-49, 54-62 above and further in view of Su (5,804,684).”

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.

Item 10. The Examiner states that “[c]laims 22 and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5,804,684) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-3, 5-6, 11-21, 23-30, 32-22, 37, 39,

41, 45-51, 53-56, 58, 60-62 above or Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039), April 2000) as applied to Claims 1-20, 24-33, 37-41, 44-49, 54-62 above and further in view of Sambrook (Molecular Cloning).”

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.

Item 11. The Examiner states that “[c]laims 33 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5,804,684) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-3, 5-6, 11-21, 23-30, 32-33, 37, 39, 41, 45-51, 53-56, 58, 60-62 above or Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) as applied to Claims 1-20, 24-33, 37-41, 44-49, 54-62 above and further in view of Arnold (5,599,667).”

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.


Item 12. The Examiner states that “[c]laims 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5,804,684) in view of Shieh (US Pat. 6,054,039, April 2000) or Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) and further in view of Arnold (5,599,6667) as applied to claim 33, 35-36 above, and further in view of Hasebe (5,151,345).

The aforementioned discussions detailing the differences between the instant invention and the inventions of Boom and Shieh overcome this rejection cited by the Examiner.

Based on the amendments and remarks above, applicants believe that all pending claims are in condition for allowance.

If the Examiner believes that a conference would be of value in expediting the prosecution of this application, the Examiner is hereby invited to telephone undersigned counsel to arrange for such a conference.

Respectfully submitted,



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